



# Our Savior Christian Academy

## *Curriculum Framework for:* **Math**

*Our Savior Christian Academy's "Curriculum Framework for Math" is designed as a tool that will follow the same format for all grades K-4. Each grade level will have a separate section based on classroom structure, and it will be up to each individual teacher to design a lesson plan that fits their classroom needs based on these standards and suggestions. Our Savior Christian Academy's "Curriculum Framework for Math" is offered to the glory of God that it may be a blessing among Lutheran school educators and their students.*

### ✠ **PHILOSOPHY** ✠

*God has created an orderly, systematic universe. Mathematics is a useful and unique God-given universal language that facilitates the ability to appreciate the created order God has given us and further advances the understanding of our modern, high-tech world. The development of mathematics abilities prepares students for lives of responsible Christian service to His church and the community.*

# Our Savior Christian Academy

## Broad Goals

### *From a Christ-Centered Perspective, Teachers will:*

- Incorporate Jesus Christ in all core areas of mathematics.
- Provide the children with a wide range of knowledge, skills, & related activities that help him/her to develop an understanding of the physical world & social exchanges.
- Give the child a language and a system through which he/she may analyze, describe and explain a wide range of experiences, make predictions, & solve problems.
- Foster creative and aesthetic development that enhances the growth of reasoning.
- Encourage the children to be confident and to communicate effectively through mathematics.

### *This will be obtained by:*

- Keeping Our Savior, Jesus Christ, as the center focus on our campus and in our curriculum.
- Fascinating and significant mathematical experiences through multi-sensory activities
- Applying mathematics to other core areas of learning
- Adapting other subjects to add valuable perspectives to the mathematics curriculum.
- Stair stepping on an individual basis with the knowledge that children acquire an understanding of mathematical ideas in an uneven way.
- Continuous assessment for analysis and planning in mathematics.
- Focuses on the identification of the children's existing knowledge, misconceptions, and strategies.
- Updating curriculum to meet changing state standards along with student needs
- Provides information that will enable the teacher to cater for individual differences in ability, previous learning and learning style, and to resist pressure to push the child to premature mechanical mastery.
- Work samples and results that are shared with the parents, congregants, and community.

# Number and Operations

1. Understand numbers, ways of representing numbers, relationships among numbers and number systems -- continued	
	Grade 5
<b>D</b>	*describe numbers according to their characteristics, including whole number <u>common factors and multiples</u> , <u>prime or composite</u> , and <u>square numbers</u>
Classify and describe numeric relationships	<p style="text-align: center;"><b>Curriculum</b></p> <ul style="list-style-type: none"> <li>given numbers on cardstock, students list the common factor of the larger number they received</li> <li>create a running list of multiple and factor in previous activity</li> <li>Groups of students will have a baggie of tile manipulatives and a layout of a bathroom. Each group will have a different number to determine the factors of and evaluate if it is a prime or composite number</li> <li>Use geoboard squares to create square numbers</li> </ul>
DOK	2
ST	MA 5 1.10

2. Understand meanings of operations and how they relate to one another	
	Grade 5
<b>A</b>	Represent and recognize division using various models, including <u>quotative</u> and <u>partitive</u>
Represent operations	<p style="text-align: center;"><b>Curriculum</b></p> <ul style="list-style-type: none"> <li>Use unifex cubes and/or Math-U-See blocks</li> <li>given a number line, circle the regular intervals (use different colors)</li> <li>solve problems from the text</li> </ul>
DOK	2
ST	MA 1 1.10
<b>B</b>	*describe the effects of addition and subtraction on fractions and decimals
Describe effects of operations	<p style="text-align: center;"><b>Curriculum</b></p> <ul style="list-style-type: none"> <li>Students explore the addition and subtraction of fraction and decimals rotating between four centers. (shade parts of a region to represent fractional parts, decode a message using information from a secret code, play a board game, and divide words into letters using fractional terms)</li> </ul>
DOK	2
ST	MA 1 1.10

## Number and Operations

3. Compute fluently and make reasonable estimates	
Grade 5	
<b>A</b>	*describe a mental strategy used to compute a given division problem, where the quotient is a multiple of 10 and the divisor is a 1-digit number (e.g., 350 /7)
Describe or represent mental strategies	<b>Curriculum</b>
	<ul style="list-style-type: none"> <li>• cut squares of construction paper to model problems</li> <li>• draw small pictures to model problems</li> </ul>
DOK	2
ST	MA 1 3.2
<b>B</b>	<u>demonstrate fluency</u> with efficient procedures for adding and subtracting decimals and fractions (with unlike denominators) and division of whole numbers
Develop and demonstrate fluency	<b>Curriculum</b>
	<ul style="list-style-type: none"> <li>• complete problems from Houghton Mifflin Math (ISBN: 0-618-33867-5)</li> <li>• verbally give answers</li> <li>• create their own flash cards to practice with a partner and at home</li> </ul>
DOK	1
ST	MA 1 1.6
<b>C</b>	apply and describe the strategy used to compute a division problem up to a 3- digit by 2-digit and addition and subtraction of fractions and decimals
Compute problems	<b>Curriculum</b>
	<ul style="list-style-type: none"> <li>• complete problems from Houghton Mifflin Math (ISBN: 0-618-33867-5)</li> <li>• complete problems on the board as a class</li> <li>• write related division fact</li> </ul>
DOK	2
ST	MA 1 3.2

# Number and Operations

<b>3. Compute fluently and make reasonable estimates -- continued</b>		
		<b>Grade 5</b>
<b>D</b>	estimate and justify products, and quotients of whole numbers and sums differences of decimals and fractions <div style="text-align: center; background-color: yellow; padding: 2px;"><b>Curriculum</b></div>	
<b>Estimate and justify solutions</b>	<ul style="list-style-type: none"> <li>• Explore the whole relationships in fractions and decimals. Using fraction and decimal strips, model the addition of fractions and decimals, and subtraction in decimals and fractions.</li> </ul>	
<b>DOK</b>	<b>3</b>	
<b>ST</b>	<b>MA 1 3.2</b>	

# Algebraic Relationships

1. Understand patterns, relations and functions	
	<b>Grade 5</b>
<b>A</b>	make and describe <u>generalizations</u> about geometric and numeric patterns <b>Curriculum</b>
Recognize and extend patterns	<ul style="list-style-type: none"> <li>given a pattern, students add the next two items</li> <li>given a pattern with items missing, students write the correct missing item</li> <li>using construction paper, students create a pattern for classmates to finish</li> </ul>
DOK	2
ST	MA 4 1.6
<b>B</b>	represent and analyze patterns using words, tables and graphs <b>Curriculum</b>
Create and analyze patterns	<ul style="list-style-type: none"> <li>solve word problems from text</li> <li>complete problems from Houghton Mifflin Math (ISBN: 0-618-33867-5)</li> <li>cut tables and graphs from the newspaper and create problems for other students to solve</li> <li>Comparative patterns from the Bible including Genesis to Revelation</li> </ul>
DOK	3
ST	MA 4 1.6
2. Represent and analyze mathematical situations and structures using algebraic symbols	
	<b>Grade 5</b>
<b>A</b>	using all operations, represent a mathematical situation as an <u>expression</u> or number sentence using a letter or symbol <b>Curriculum</b>
Represent mathematical situations	<ul style="list-style-type: none"> <li>given word problems, students write the number sentence needed to solve</li> <li>complete problems from Houghton Mifflin Math (ISBN: 0-618-33867-5)</li> <li>Solve using parable “The Hidden Treasure” Matthew 13:44</li> </ul>
DOK	2
ST	MA 4 1.10
<b>B</b>	*use the <u>commutative, distributive and associative</u> properties for fractions and decimals <b>Curriculum</b>
Describe and use mathematical manipulation	<ul style="list-style-type: none"> <li>complete problems from Houghton Mifflin Math (ISBN: 0-618-33867-5)</li> </ul>
DOK	2
ST	MA 4 3.2

## Algebraic Relationships

3. Use mathematical models to represent and understand quantitative relationships	
Grade 5	
<b>A</b>	<p><u>model</u> problem situations and draw conclusions, using representations such as graphs, tables or number sentence</p> <p style="text-align: center;"><b>Curriculum</b></p>
Use mathematical models	<ul style="list-style-type: none"> <li>• given text problems with facts, draw a graph, table or number sentence to model it</li> <li>• complete problems from Houghton Mifflin Math (ISBN: 0-618-33867-5)</li> <li>• students create a problem and exchange with a classmate who then creates a graph, table or number sentence.</li> </ul>
DOK	3
ST	MA 4 1.6

4. Analyze change in various contexts	
Grade 5	
<b>A</b>	<p>*identify, model and describe situations with constant or varying rates of change</p> <p style="text-align: center;"><b>Curriculum</b></p>
Analyze change	<ul style="list-style-type: none"> <li>• using painter's tape, record each student's height at the beginning of the school year, at Christmas break and at the end of the year</li> <li>• Measure and record each student's growth</li> <li>• create a chart to show how tall each student would be at the end of the next school year with the same rate of growth</li> </ul>
DOK	3
ST	MA 4 1.6

# Geometric and Spatial Relationships

<b>1. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships</b>	
<b>Grade 5</b>	
<b>A</b>	analyze and classify 2- and 3-dimensional shapes by describing the <u>attributes</u>
Describe and use geometric relationships	<div style="text-align: right; margin-bottom: 10px;"><b>Curriculum</b></div> <ul style="list-style-type: none"> <li>find examples of each shape in the classroom</li> <li>List and label the examples found</li> <li>students find example of each shape at home; record what they find to share</li> </ul>
<b>DOK</b>	<b>2</b>
<b>ST</b>	<b>MA 2 1.10</b>
<b>C</b>	predict and justify the results of subdividing, combining and <u>transforming shapes</u>
Compose and decompose shapes	<div style="text-align: right; margin-bottom: 10px;"><b>Curriculum</b></div> <ul style="list-style-type: none"> <li>given tangrams, students create new shapes, trace and color them</li> <li>given a specific end goal (such as, make a house), students decide which shapes to use and record them</li> <li>combine tangrams to make a new shape. Trace, and color the individual shapes making the larger shape</li> </ul>
<b>DOK</b>	<b>3</b>
<b>ST</b>	<b>MA 2 1.6</b>

<b>2. Specify locations and describe spatial relationships using coordinate geometry and other representational systems</b>	
<b>Grade 5</b>	
<b>A</b>	*use <u>coordinate systems</u> to specify locations, describe paths and find the distance between points along horizontal and vertical lines
Use coordinate systems	<div style="text-align: right; margin-bottom: 10px;"><b>Curriculum</b></div> <ul style="list-style-type: none"> <li>complete worksheets; solve a math problem with letter next to it.</li> <li>Check answer by writing letters to answer a question with the letters</li> </ul>
<b>DOK</b>	<b>2</b>
<b>ST</b>	<b>MA 2 1.10</b>

## Geometric and Spatial Relationships

3. Apply transformations and use symmetry to analyze mathematical situations	
Grade 5	
<b>A</b>	*predict, draw and describe the results of <u>sliding/ translating, flipping/ reflecting and turning/ rotating around a center point</u> of a polygon
Use transformations on objects	<p><b>Curriculum</b></p> <ul style="list-style-type: none"> <li>Given a worksheet with shapes, students write their prediction, model it with a construction paper shape and then write if they were correct or not</li> </ul>
DOK	3
ST	MA 2 3.6
<b>C</b>	identify polygons and designs with <u>rotational symmetry</u>
Use symmetry	<p><b>Curriculum</b></p> <ul style="list-style-type: none"> <li>Student make t-charts to determine ability to discriminate between objects that do and do not contain rotational symmetry.</li> </ul>
DOK	1
ST	MA 2 1.6

4. Use visualization, spatial reasoning and geometric modeling to solve problems	
Grade 5	
<b>A</b>	given a <u>net of a prism</u> or cylinder, identify the 3-dimensional shape
Recognize and draw three-dimensional representations	<p><b>Curriculum</b></p> <ul style="list-style-type: none"> <li>Given various net cut outs, create 3-dimensional shapes</li> </ul>
DOK	2
ST	MA 2 3.3

# Measurement

1. Understand measurable attributes of objects and the units, systems and processes of measurement	
Grade 5	
<b>A</b>	*identify and justify the unit of measure for area (customary and metric)
Determine unit of measurement	<div style="text-align: right; margin-bottom: 5px;"><b>Curriculum</b></div> <ul style="list-style-type: none"> <li>complete problems from Houghton Mifflin Math (ISBN: 0-618-33867-5)</li> <li><a href="http://www.biblestudy.org/beginner/bible-weights-and-measures.html">http://www.biblestudy.org/beginner/bible-weights-and-measures.html</a></li> </ul>
DOK	3
ST	MA 2 3.1
<b>B</b>	identify the equivalent weights and equivalent capacities within a system of measurement
Identify equivalent measures	<div style="text-align: right; margin-bottom: 5px;"><b>Curriculum</b></div> <ul style="list-style-type: none"> <li>given photocopies of rulers, cut and paste to show equivalent measurements</li> <li>given measuring cups, explore with measurements are equivalent. Write findings.</li> </ul>
DOK	1
ST	MA 2 1.6

# Measurement

2. Apply appropriate techniques, tools and formulas to determine measurements	
	Grade 5
<b>C</b>	determine volume by finding the total number of the same size units needed to fill a space without gaps or overlaps
Apply geometric measurements	<p><b>Curriculum</b></p> <ul style="list-style-type: none"> <li>• Students take turns filling container by pouring in pints of water, one at a time. They should stop before each pint is added and estimate the weight. After each pint is added, they should measure and record the weight and discuss their observations.</li> <li>• After the first pint is poured into the gallon container, ask them how heavy they think two pints will be. Have them predict the weight of three pints.</li> <li>• After the second pint of water is poured, ask students to evaluate how close their predictions were. Students then add a third pint.</li> <li>• Students continue to fill the container until they have measured and recorded the weight of 1 gallon. When they have recorded the number of pints they used to fill the gallon container and the weight at each stage, encourage them to describe any patterns in the measurements.</li> <li>• Emphasize that during the investigation, students recorded several estimates and predictions. Have them name some of the things that they estimated and predicted. Encourage them to think of ways to organize and show these estimates and predictions.</li> </ul>
DOK	2
ST	MA 2 1.10

2. Apply appropriate techniques, tools and formulas to determine measurements -- continued	
	Grade 5
<b>F</b>	convert from one unit to another within a system of linear measurement (customary and metric)
Use relationships within a measurement system	<p><b>Curriculum</b></p> <p>L Build an expanded yard stick: (Expanded yard stick, picture follows lesson.)</p> <ul style="list-style-type: none"> <li>• Using poster paper or adding machine tape, make a strip of white paper 1 yard long and label it on "1 yard".</li> <li>• Make another strip of white paper 1 yard long and divide it into 3 feet and label each foot.</li> <li>• Make another strip of paper 1 yard long and divide it into 36 inches.</li> <li>• Label the whole strip "Inches" and number each inch.</li> <li>• Color the 12* and the 24* mark a different color.</li> </ul> <p>2. Show students that the expanded yard stick is a tool that can be used to convert from one unit of linear measure to another within the customary measurement system.</p>
DOK	1
ST	MA 2 1.6

# Data and Probability

<b>1. Formulate questions that can be addressed with data and collect, organize and display relevant data to answer them</b>	
<b>Grade 5</b>	
<b>A</b>	evaluate data-collection methods
<b>Formulate questions</b>	<div style="text-align: right; margin-bottom: 10px;"><b>Curriculum</b></div> <ul style="list-style-type: none"> <li>Survey members of other classes on cross-curricular topics</li> <li>Complete cross-curricular experiments</li> <li>Evaluate the method used</li> </ul>
<b>DOK</b>	3
<b>ST</b>	<b>MA 3 1.2</b>
<b>C</b>	*describe methods to collect, organize and represent <u>categorical</u> and <u>numerical</u> data
<b>Represent and interpret data</b>	<div style="text-align: right; margin-bottom: 10px;"><b>Curriculum</b></div> <ul style="list-style-type: none"> <li>survey classmates; organize data (for example: favorite color, food, etc.)</li> <li>record observations over a week’s time (or more). (for example: weather, temperature)</li> <li>create a table or graph based on what was learned.</li> <li>Describe the method used in an essay</li> </ul>
<b>DOK</b>	2
<b>ST</b>	<b>MA 3 1.2</b>

<b>2. Select and use appropriate statistical methods to analyze data</b>	
<b>Grade 5</b>	
<b>A</b>	compare related data sets
<b>Describe and analyze data</b>	<div style="text-align: right; margin-bottom: 10px;"><b>Curriculum</b></div> <ul style="list-style-type: none"> <li>survey classmates; organize data (for example: favorite color, food, etc.)</li> <li>record observations over a week’s time (or more). (for example: weather, temperature)</li> <li>create a table or graph based on what was learned.</li> <li>Compare the related data sets</li> </ul>
<b>DOK</b>	2
<b>ST</b>	<b>MA 3 1.6</b>

# Data and Probability

3. Develop and evaluate inferences and predictions that are based on data	
	<b>Grade 5</b>
<b>A</b>	given a set of data make and justify predictions
<b>Develop and evaluate inferences</b>	complete problems from Houghton Mifflin Math (ISBN: 0-618-33867-5) <span style="float: right;"><b>Curriculum</b></span>
<b>DOK</b>	3
<b>ST</b>	<b>MA 3 3.5</b>

4. Understand and apply basic concepts of probability	
	<b>Grade 5</b>
<b>A</b>	*describe the degree of likelihood of events using such words as certain, equally likely and impossible
<b>Apply basic concepts of probability</b>	Students learn what probability is by predicting the outcome of planned experiments, and playing racing games. <span style="float: right;"><b>Curriculum</b></span>
<b>DOK</b>	2
<b>ST</b>	<b>MA 3 1.10</b>

### **Integrating Faith:**

All four mathematical operations are recorded in Genesis 1-2 creation account. For example, God made a day and he divided it into evening and morning. He made one day; then He added something to it. He commanded animals to multiply upon the earth, adding numbers of "like things" to His creation. He subtracted a rib from Adam; then He added another human, Eve. Mathematically, **addition** is the basis of all other operations. So we start there. The first thing God did was to add something to the nothing that existed—the heavens and the earth (Gen. 1:1). His first act was one of addition. Addition is generally used in connection with added blessings, usually a result of obedience. However, sometimes the term "add" has an undesirable connotation such as when God adds a curse as a result of disobedience. Addition and **subtraction** are operational inverses. Inverse means "reverse order." In other words, it is a doing/undoing relationship.

Addition is related to **multiplication** in that multiplication is simply a quick way to do addition. For example, when we say "3x5," all we're saying is "3 added together 5 times" or "5 added together 3 times." Multiplication is based upon addition. Therefore, scripturally speaking, it too is viewed in terms of blessings. An example of this is God's command to "be fruitful and multiply" to fill the earth. God multiplied His creation in the initial six-day period. Now we are commanded to imitate what He has done, in obedience to His law of replenishing His kingdom and exercising dominion over it.

**Division** is related to multiplication in the same way subtraction is to addition. In division, you unmultiply. In other words, you split up what has been multiplied. Division implies a result. For example, God's division of mankind at the tower of Babel was a result of disobedience to His law. (For a treat, use a concordance to look up all the instances of God's exercising His mathematical laws in the basic operations.)

Mathematics, then, demonstrates that God has given us His law with blessings and curses. Addition and multiplication are generally related to blessings as a result of obedience; subtraction and division are often related to curses as a result of disobedience.

We can also see God in the mathematical notion of **place**. Just as God designed a dwelling place for Himself—the Tabernacle—so He designed a dwelling place for numbers. The mathematical notion of place is the understanding that numbers make sense only in their notational context. In other words, just as a string of words in language means nothing without grammar and syntax, so place value determines the meaning of numbers in notation. This is the "decently and in order" principle (1 Cor. 14:40) which is the key to the placement of numbers in their meaningful context. Furthermore, in place value, you have the recognition of the cyclical nature of numbers in the cycle of the moon, year, and seasons—all God-ordained according to His law. From the position of convenience, as well as reflecting order in the universe, we need to realize that numbers do occur in patterns and cycles. God's nature is also revealed through the patterns and cycles of fractions, time, and money. **Fractions** are essentially division problems. Fractions take a whole and divide it into parts, whether it's one pie divided into eight pieces or one apple divided into halves. This simply reflects that wholes are made up of parts. This is reflective of God's unity and His plurality—three Persons in one God.

That aspect of God's creation which we call **time**, we also enumerate. We divide it into parts of the whole. Time is created by God with a beginning and an ending. However, God does not reside in time, which is the passage of one moment to the next, measuring the duration of actions. Time deals with God's plan for the universe. He works all things after the counsel of His own will (Eph. 1:11). Measurement and passage of time are constant reminders that man is not autonomous. God appoints the time of our birth and time of our death (Heb. 9:27). We cannot escape time. God expects us to look at its patterns and use it His way and for His glory! Like the psalmist, we should exclaim, "What is man that thou art mindful of him? . . . As for man, his days are like grass; as a flower of the field, so he flourishes" (Ps. 8:4; 103:15).

**Money** is another part of God's creation, which we enumerate. Money is simply an application of quantity and quality to the things God has made. It is related to weights and measures, which are numerical qualities of physical objects. In the Scriptures, money is derived from the weight of a valuable substance. Silver, gold, and copper are the metals valued highly enough to be used as coinage. The whole point of a coin is that it is the value of that weight of that particular precious metal. Money is necessary to the functioning of a commercial economy (viz., the accepted value of different animals as sacrifices in Levitical law). Gold and silver are seen as being created by God for use as money. Our modern notion of money being backed by the state is not found in Scripture. Correct use of money is one aspect of exercising dominion for Christ.

Everything in God's creation has numerical quality, its little mathematical tab. Applying mathematical principles and operations practically in God's universe helps to fulfill His commandments to use all things lawfully. Solving **word problems** by taking the tools of math and applying them to practical situations is a major way of accomplishing that objective. Such an understanding is required for the exercise of wise stewardship over the resources God has given. If children have nothing but math facts in their heads and don't learn to apply these in a godly way for godly purposes, their knowledge is useless.

Math values are taught over and over - "precept upon precept, line upon line, here a little, there a little" (Isa. 28:10). If they do happen to remember, their sin nature will quickly tempt them to choose to forget. So then, if a child is prone to forget, should we stop teaching godly values because we feel "It's too hard" or "They'll never get this . . ."? For example, if some little children are consistently mean to one another, in spite of frequent godly admonitions, are we to simply quit teaching Ephesians 4:32 for awhile, and let them beat each other up in the meantime? The answer is obvious: "No way!"

Math is truth because God made it that way. For God's creation is so reflective of His grandeur that it ought to bring us all to our knees shouting: "You, LORD, have made me glad through Your work; I will triumph in the works of Your hands. O LORD, how great are Your works! Your thoughts are very deep" (Ps. 92:4-5).

*Adapted from : <http://www.christcentercurriculum.com/article-ccp-math-roots-in-scripture.php>*